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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,431	02/21/2007	Leif Wilhelmsson	P18538-US2	6534

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EXAMINER	
PATEL, DHAVAL V	
ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,431	WILHELMSSON ET AL.	
	Examiner	Art Unit	
	DHAVAL PATEL	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 24-29* is/are rejected.

7)☒ Claim(s) *10-23 and 30-38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/13/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1-3 and 24-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Martin et al. (7,295,638) (hereafter Martin).**

Regarding claims 1 and 24, Martin discloses a method and apparatus of receiving a spread-spectrum signal (Fig. 3, receiver), the method comprising correlating (Fig. 5, correlate, 290) the received spread-spectrum signal (Fig. 5, binary data source received) with a reference signal (Fig. 4, spreading code generator, 216 and 292) to detect the presence of one of a number of reference spreading codes (Fig. 5); wherein the correlating further comprises performing at least one of the following steps resulting in a differentiated correlation signal: differentiating the received spread-spectrum signal (Fig. 5, differential detector, 270 with delayed received signal, 278 and complex conjugate, 282, col. 3 lines 50-53) and the reference signal (Fig. 5, differential reference code, col. 16 lines 56-60); and differentiating the correlation signal (Fig. 5, col. 16 lines 35-37, and lines 56-59): and wherein the differentiated correlation signal comprises a sequence of signal samples (Fig. 5, binary data source, 204 and up

sampling, 208, each signal sample having a complex value (Fig. 3, I and Q values from down-conversion is complex value).

Regarding claims 2 and 25, Martin further discloses a method and apparatus, wherein the method further comprises detecting a frequency error of the received spread-spectrum signal from the differentiated correlation signal (col. 12 lines 63-67 discloses differential detection of code helps mitigate the phase noise as well as frequency offsets).

Regarding claims 3 and 26, Martin further discloses a method and apparatus, further comprising accumulating the differentiated correlation signal to obtain a correlation value (Fig. 5, integrator, 294).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

> The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: ***(See MPEP Ch. 2141)***

a. Determining the scope and contents of the prior art;
b. Ascertaining the differences between the prior art and the claims in issue;

c. Resolving the level of ordinary skill in the pertinent art; and
d. Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.

4. **Claims 4,5, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin in view of Imamura et al. (US 7,149,266) (hereafter Imamura).**

Regarding claims 4 and 27, Martin does not explicitly disclose a method according to claim 1, wherein the method further comprises detecting a frequency error of the from the determined correlation value.

In the same field of endeavor, Imamura teaches signal receiver and method of compensating frequency offset in which as shown in Fig. 11, teaches correlator units to correlator the received signal with the reference signal (51, 52, 53 and 61) and detecting the peak value (54). Furthermore, Fig. 11 teaches from the peak detector the frequency offset estimation value (frequency error).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Imamura, into the system of Martin, as a whole, so as to detect the frequency error from the accumulated or integrated differential values, the motivation is to provide a signal receiver and a frequency offset compensation (col. 5 lines 32-34).

Regarding claims 5 and 28, Martin does not explicitly disclose a method according to claim 4, further comprising determining a frequency compensation factor from the angle argument of the correlation value.

In the same field of endeavor, Imamura teaches signal receiver and method of compensating frequency offset in which as shown in Fig. 11, teaches correlator units to correlator the received signal with the reference signal (51, 52, 53 and 61) and detecting the peak value (54). Furthermore, Fig. 11 teaches from the peak detector the frequency offset estimation value (frequency error). Furthermore, Imamura teaches generating frequency offset compensated signal by applying the phase rotation to the received signal (65, frequency offset estimating circuit and 37, phase rotation circuit to generate frequency offset compensated signal, here, phase rotation would be compensation factor).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Imamura, into the system of Martin, as a whole, so as to detect the frequency error from the accumulated or integrated differential values and generate frequency offset compensation signal by applying phase rotation, the motivation is to provide a signal receiver and a frequency offset compensation (col. 5 lines 32-34).

5. **Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martin and Imamura, as applied to claims 5 and 28 above, and further in view of Abraham et al. (US 7,184,464) (hereafter Abraham).**

Regarding claim 6, A method according to claim 3, wherein accumulating comprises coherently accumulating the differentiated correlation signal.

In the same field of endeavor, Abraham teaches apparatus and method of computing correlation at multiple resolutions, in which as shown in Fig. 1, the convolution processor (109) processes the correlation between the received complex value with the GPS C/A code (select PN) and further stored the I and Q results in signal RAM (110a and 110b). here, both the I and Q value accumulation is coherent accumulation.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Abraham, into the system of both Martin and Imamura, as a whole, so as to coherently accumulate the correlation results as generated, the motivation is to provide improved, simple and low cost GPS processing (col. 2 lines 49-55).

6. **Claims 7,8, 9 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin, Imamura and Abraham, as applied to claim 6 above, and further in view of Lennen et al. (US 6,888,879) (hereafter Lennen).**

Regarding claims 7 and 29, the combined teachings Martin, Imamura and Abraham do not explicitly disclose a method according to claim 6, wherein the received spread-spectrum signal comprises a digital information message encoded as bits, wherein bit transitions of the digital information message occur at predetermined transition time intervals; and wherein coherently accumulating comprises coherently accumulating the differentiated correlation signal over a time interval that is longer than half the transition time interval.

In the same field of endeavor, Lennen teaches method and apparatus for fast acquisition and low SNR tracking in satellite positioning system in which col. 10 lines 22-50 teaches memory processor 83 accumulates samples that are identically positioned within the code epoch period in the incoming C/A code. GPS data are 20 ms long and hence the summation may be done over a 20 msec period (or longer accumulation or integration if data bit transitions are known). The 20 msec summations of the incoming signals are played back at the faster rate. If the memory accumulates for longer, 100msec instead of 20msec for example, further improvement is achieved. and accumulations for period longer than 20msec in the processor may require knowledge of data bit transitions.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Lennen, into the system of Martin, Imamura and Abraham, as a whole, so as to coherently accumulating the differential correlation results of Martin, Imamura and Abraham, with longer accumulation results, the motivation is to provide improved signal acquisition and measurement in satellite positioning receivers and in particular to fast acquisition in low SNR (col. 2 lines 54-57).

Regarding claim 8, Martin further discloses a method according to claim 7, wherein differentiating comprises differentiating on a single-chip time scale (col. 3 lines 57-63, differential chip detector with delayed by N chip period and N is preferably one).

Regarding claim 9, Martin further discloses a method according to claim 1, wherein differentiating a signal comprises delaying the signal by a predetermined number of chips (col. 16 lines 28-33, differential detection comprises output chips which are a function of a plurality of successive chips of the received signal).

Allowable Subject Matter

7. Claims 30-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DHAVAL PATEL whose telephone number is (571)270-1818. The examiner can normally be reached on M-F 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dhaval Patel/
Examiner, Art Unit 2611
6/2/2009
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611